or so, when this huge basin all boils up at once in one immense cauldron of seething waters? Flood rock answers these questions in part. It says that explosions of some kind do the work; but this answer only opens the door and points to a sea of data yet to be secured as to the nature, component parts and *modus operandi* of these explosions, which differ evidently in different cases.

Note.—The seismological observations to determine the duration and extent of the earth and atmospheric waves were taken on two lines running at right angles with each other. General Henry L. Abbot, of the United States Corps of Engineers, had charge of the observatories on an east and west line on Long Island, with headquarters at Willet's point. The north and south line was in charge of Professor F. W. Clarke, of the United States Geological Survey, Washington. He had his southern station on Staten island, in charge of Professor H. M. Paul of the United States Naval observatory. At the next station, on Ward's island, Professor T. C. Mendenhall, of the United States Signal Service, and himself observed. At Yonkers Professor William Hallock, of the United States Geological Survey, and student Thomas Ewing, Jr., of Columbia College, occupied a station. The most northerly observatory of the chain was at Vassar College, in charge of Professor Maria Mitchell. Dr. Daniel Draper took observations on a number of instruments at Central park. The astronomers at Princeton, Harvard and Rutgers colleges also made observations in conjunction with the others.

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EDITORS' TABLE.

EDITORS: A. S. PACKARD AND E. D. COPE.

—— It is safe to say that the greatest necessity of scientific progress in the United States to-day is schools and academies of original research. We have colleges and universities enough in most of the States, but there has not yet been established a single school where knowledge is produced, which corresponds in scope with the numerous institutions where it is taught. Perhaps it is a general impression that there is already more knowledge in the world than can be learned; but, if this be true, it can not for a moment obscure the greater truth, that most of the laws of nature remain still, more or less, unknown. It is, or ought to be,

well known, that all the knowledge taught in the schools is the product of original research, and that all books of any value in libraries, excepting works of the imagination, are derived from the same source. Hence, it appears that the absence of schools of research is a phenomenon for which it is difficult to account. There are some schools of this kind which cover a limited part of the field of knowledge, such as the summer schools of biology on the coast; and there are some museums where a limited amount of research is conducted, as much as their financial and intellectual resources permit. But these institutions are either so limited in means, or so completely under the control of non-investigators, that they are ineffective at present, or offer no prospect of progression in the future.

If any public-spirited citizen desires to erect for himself a unique and enduring monument, such can not be more effectively and usefully done than by the endowment of an Academy of Original Research. Such an institution would be a perpetual spring and source of knowledge and truth, and a living "nucleus" in the great organic body of society.

An institution which should cover most of the ground might be organized on the following basis: Six departments might be established, namely: 1, Astronomy; 2, Physics; 3, Chemistry; 4, Geology; 5, Vegetable Biology; 6, Animal Biology. For each of these departments the annual expenses would be as follows:

For salary of director	$3,500
For salary of assistant	1,000
For material (apparatus and specimens)	3,500
For books	500
	$8,500

which is, for the six departments, $51,000. Then there should be $7,000 per annum for publications, leaving $2,000 for janitor and other necessary expenses. The total income of $60,000 represents an endowment of $1,000,000. Of course, the details might be varied according to probable necessities, etc. And for a smaller endowment, fewer departments might be created, but not without seriously crippling the institution. Various details, such as the boundaries of the departments, the duties of assistants, etc., would have to be fixed. A certain number of lectures should be given by the directors, which should serve as an index of the characteristics of the workers and their work.

In the selection of the men who should act as directors of the departments, the principal difficulty is to be encountered. The enterprise of the American is no less marked in the struggle for place and reputation, than in the struggle for the almighty dollar. Qualification is little thought of by too many persons, who from physical or mental weakness, or some other cause, desire to live without labor. The charter of an institution of research should embrace a provision, that the position of director should be forfeited by that one who should not produce some original work of merit every year or two, or during some other definite time. In no other way could the institution be preserved from the intellectual decay into which so many have fallen; and in no other way could it be protected from patrons whose kind intentions might include personal favorites unknown to scientific research. Men of money who desire to sustain original research will be compelled to devote some inquiry as to who are the men who are loyal to this work. The best index they can find to this class is the record of their work already done.

The best mode of government of such an institution would be by a senatus composed of the six directors of the departments and an equal number of trustees of the endowment. In this way the greatest amount of wisdom would be brought to bear on the two questions of administration, viz: the preservation of the fund, and the manner of its expenditure.—*C.*

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RECENT LITERATURE.

THE UNPAIRED FINS OF SELACHIANS.[1]—Dr. Paul Mayer, under the above caption, discusses the median fins of Selachians and throws new light upon a number of morphological questions which have lately arisen. He carries Dohrn's conclusions still farther, and has actually discovered at the end of the tail and on the back of the young embryo of Pristiurus and of Scyllium homogeneous structures (Hautknöpfe) of subepiblastic origin, of the same substance as the horn-fibers or actinotrichia in the finfolds. These button-like structures are found on the back of the embryo, in a single row, on either side of the median line and in advance of the permanent dorsal. At the end of the tail they are in two rows, viz., a dorsal and a ventral series. In both situations they are metameric in position, and sections show that temporary muscular buds are thrust outward towards these singular lateral larval organs from the muscular segments or myotomes in the same way as to the bundles of fibers or actinotrichia representing rays in the median and paired fins.

These remarkable organs Mayer regards as the vestiges or remnants of parapodia, and therefore names them *parapodoids.*

[1] *Die unpaaren Flossen der Selachier.* Mitt. Zool. Stat. zu Neapel. VI, pp. 217–285, pl. 15–19. 1885.